

AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings includes changes to Figures 1 and 3-10. These sheets, which include Figures 1 and 3-10, replace the original sheets including Figures 1 and 3-10. The identifying labels in Figures 1 and 3-10 are now renumbered in compliance with 37 C.F.R. §1.84(U)(1).

Attachments: Replacement Sheet for Figure 1
Annotated Sheet Showing Changes for Figure 1

Replacement Sheet for Figure 3
Annotated Sheet Showing Changes for Figure 3

Replacement Sheet for Figure 4
Annotated Sheet Showing Changes for Figure 4

Replacement Sheet for Figure 5
Annotated Sheet Showing Changes for Figure 5

Replacement Sheet for Figure 6
Annotated Sheet Showing Changes for Figure 6

Replacement Sheet for Figure 7
Annotated Sheet Showing Changes for Figure 7

Replacement Sheet for Figure 8
Annotated Sheet Showing Changes for Figure 8

Replacement Sheet for Figure 9
Annotated Sheet Showing Changes for Figure 9

Replacement Sheet for Figure 10
Annotated Sheet Showing Changes for Figure 10

REMARKS**Status of the Claims**

Claims 2-16 and 19-22 are pending after entry of this paper, of which claims 9-16, 19, 20 and 22 are withdrawn from consideration. Claims 1, 17 and 18 have been cancelled without prejudice. Claims 2-8 and 21 stand rejected after entry of the instant paper. Applicants reserve the right to prosecute the subject matter of the withdrawn or cancelled claims in one or more continuing or divisional applications.

Claim 2 has been amended to be independent and to include the phrase “An isolated.” Furthermore, the subject matter of claim 1 has been incorporated into claim 2 by the phrase “CD14, CD34,”.

Claims 3 and 8 have been amended to depend only from claim 2, the term “isolated” has been added and the term “can” has been replaced with “is able to”.

Claim 4 has been amended to include the term “isolated”.

Claim 5 has been amended to depend only from claim 2, the term “isolated” has been added, the term “can” has been replaced with “is able to” and the phrase “a culture under a condition inducing differentiation into cardiac muscle such as” has been deleted.

Claim 6 has been amended to depend only from claim 2, the term “isolated” has been added, the term “can” has been replaced with “is able to” and the phrase “a culture under a condition inducing differentiation into nerve, such as” has been deleted.

Claim 7 has been amended to depend only from claim 2, the term “isolated” has been added, the term “can” has been replaced with “is able to” and the phrase “a culture under a condition inducing differentiation into endothelium, such as” has been deleted.

Claim 21 has been amended to depend only from claim 2 and the term “A” has been replaced with the term “The”.

Withdrawn claims 9, 11, 13-16 and 19-20 have been amended to depend from claim 2.

No new matter is introduced by these amendments. Support may be found throughout the application and claims as originally filed.

Drawings

The replacement drawings will replace all prior versions of the drawings in the instant application. The drawings have been amended to comply with 37 C.F.R § 1.84(U)(1), which states that partial views of a drawing which are intended to form one complete view, whether contained on one or several sheets, must be identified by the same number followed by a capital letter. For example Fig. 10 has three separate panels of drawings, which have been renumbered as “FIG. 10A, FIG. 10B and FIG. 10C.” The specification has been amended accordingly to coincide with the new numbering under 37 C.F.R § 1.84(U)(1). No new matter is introduced.

Response to Rejections

35 U.S.C. § 112, first paragraph Rejections

Claims 17 and 18 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

Applicants have cancelled claims 17 and 18 thereby rendering this rejection moot.

35 U.S.C. § 112, second paragraph Rejections

The Examiner has rejected claims 1-8, 17-18 and 21 as being indefinite under 35 U.S.C. §112, second paragraph. Specifically, the Examiner contends that the recitation “derived from a monocyte” in claim 1 is unclear. Further, the Examiner alleges that the

phrase “such as” in regard to claims 5-7 and the limitation “can” in regard to claims 3 and 5-8 renders these claims indefinite. Additionally, the Examiner points out that claims 2, 4, 17, 18 and 21 are indefinite for being dependent from indefinite claims.

Applicants respectfully disagree with the Examiner’s contention. However, in order to expedite prosecution and solely for the purpose of allowance of the instant application, applicants have cancelled claim 1 rendering the rejection under 35 U.S.C. §112, second paragraph to claim 1 moot. Further, applicants have amended claims 5-7 to delete the recitation “such as” and applicants have amended claims 3 and 5-8 replacing the word “can” with the phrase “is able to,” clarifying the characteristic of the claimed cell, i.e. differentiation ability.

With respect to claims 2, 4, 17, 18 and 21 as being dependent from indefinite claims, applicants wish to point out that claim 2 is now in the independent format and claims 4 and 21 have been amended to depend from claim 2. Claims 17 and 18 have been cancelled.

In view of these amendments to the claims, applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §112, second paragraph.

35 U.S.C. § 101 Rejections

The Examiner has rejected claims 1-8 for being directed to non-statutory subject matter under 35 U.S.C. § 101. Specifically, the Examiner refers to the claimed monocyte-derived multipotent cell and progenitor cells as being products of nature and not “isolated.”

In order to expedite prosecution and solely for the purpose of advancing allowance of the instant application, as previously noted, applicants have cancelled claim 1, rendering the rejection to claim 1 moot. In addition, applicants have amended claims 2-8 to recite “isolated monocyte-derived multipotent cell” as suggested by the Examiner. The

amendments to the claims are supported throughout the instant specification, more specifically in Example 1 on page 22 as indicated by the Examiner.

In view of these amendments, reconsideration and withdrawal of the rejection of claims 1-8 under 35 U.S.C. §101 are respectfully requested.

35 U.S.C. § 102 Rejections

The Examiner has rejected claims 1-8 under 35 U.S.C. § 102(b) as being anticipated by Zhao, et al. (*PNAS*, 100: 2426-2431, 2003). Specifically, the Examiner alleges that Zhao, et al. teaches the isolation of pluripotent stem cells (PSC) from human peripheral blood monocytes, that resemble fibroblasts and express the monocytic and hematopoietic cellular differentiation stem cell markers, such as CD14, CD34 and CD45. The Zhao, et al. reference allegedly further teaches that human peripheral blood cells containing monocytes, when cultured under specific conditions, differentiate into macrophages, lymphocytes, epithelial, neuronal, endothelial and hepatocytes. Applicants traverse this rejection for the reasons discussed below.

Independent claim 1 has been cancelled as previously noted, rendering this rejection to claim 1 moot. Dependent claim 2 has been amended to be in the independent format and combine limitations of claims 1 and 2, and thus been directed to an isolated monocyte-derived multipotent cell (MOMC) expressing CD14, CD34, CD45 and type I collagen. Dependent claims 3-8 have been amended to be dependent from claim 2.

With respect to Zhao, et al., the prior art does not teach each and every element as set forth in the currently amended claims. The pluripotent stem cells (PSC) as described by Zhao, et al. (Discussion, page 2430) express CD14, CD34 and CD45 but do not express type I collagen as stipulated in the claimed invention. Therefore, merely for this reason, the claimed invention is not anticipated by Zhao, et al.

Moreover, the Examiner alleges that the pluripotent stem cells (PSC) according to Zhao, et al. (pages 2428-2430) are able to differentiate into macrophages, lymphocytes, epithelial, neuronal, endothelial and hepatocytes. On the other hand, the monocyte-derived multipotent cells (MOMC) are only able to differentiate into mesenchymal, myocardial, nerve, endothelial and mesodermal cells. According to the Examiner, macrophages, monocytes, lymphocytes etc. belong to the mesenchymal or mesodermal family (*Stem Cells*, NIH, June 2001, pages 32-35) and since mesenchymal and mesodermal cells are recited in the claimed invention, this limitation is inherent in the teaching of Zhao, et al. Thus, according to the Examiner, Zhao, et al. allegedly anticipates the claimed invention.

Applicants disagree with the Examiner for the following reasons. The monocyte-derived multipotent cells (MOMC) of the present invention are unable to differentiate into epithelial and hepatocyte cells which are part of the hematopoietic family and not part of the mesenchymal or mesodermal family as suggested by the Examiner (*Stem Cells*, NIH, June 2001, pages 32-35 & Appendix D). Therefore, the present invention is not anticipated by Zhao, et al, because the monocyte-derived multipotent cells (MOMC) do not accomplish the same cell differentiation as the pluripotent stem cells (PSC) described by Zhao, et al. Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 102(b) rejection to claims 1-8.

35 U.S.C. § 103 Rejections

Claim 21 is rejected as allegedly being obvious under 35 U.S.C. § 103(a) over Zhao, et al. (*PNAS* 100: 2426-2431, 2003) in view of Pujol, et al. (*Differentiation* 65: 287-300, 2000). Claim 21, which currently depends from claim 2, relates to an isolated monocyte-derived multipotent cell expressing CD14, CD34, CD45 and type I collagen, where

this monocyte is obtained by culturing peripheral blood mononuclear cells (PBMCs) *in vitro* on fibronectin, and collecting fibroblast-like cells expressing CD14 and CD34.

The Zhao, et al. reference discusses that the pluripotent stem cells expressing CD14, CD34 and CD45 are obtained by culturing peripheral blood mononuclear cells. The Examiner attempts to reach the claimed invention by combining the teachings of Zhao, et al. and Pujol, et al., where the latter teaches culturing CD14 monocytes derived from PBMC on fibronectin-coated tissue culture plates (page 288, "Cell Culture"). Since Zhao, et al. does not teach each and every element as set forth in the claims, particularly, the multipotent stem cells which also express type I collagen (Discussion, page 2430) as stipulated in the claimed invention, together even with Pujol, et al., the deficiencies of Zhao, et al. are not overcome with Pujol, et al. Therefore, because neither Zhao, et al. nor Pujol, et al. alone, or in combination, uses an isolated monocyte-derived multipotent cell expressing CD14, CD34, CD45 and type I collagen, the cited art does not make the dependent claim 21 obvious. Hence, applicants respectfully request reconsideration and withdrawal of this §103 rejection.

CONCLUSION

Based on the foregoing amendments and remarks, the applicants respectfully request reconsideration and withdrawal of the pending rejections and allowance of this application. The applicants respectfully submit that the instant application is in condition for allowance. Entry of the amendment and an action passing this case to issue is therefore respectfully requested. In the event that a telephone conference would facilitate examination of this application in any way, the Examiner is invited to contact the undersigned at the number provided. Favorable action by the Examiner is earnestly solicited.

AUTHORIZATION


The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. **13-4500**, Order No. 4439-4005.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. **13-4500**, Order No. 4439-4005.

Respectfully submitted,
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